Los Alamos team wins best paper award at Sustainable Development Conference

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Los Alamos researchers Yongchao Yang, Alessandro Cattaneo and David Mascareñas of the National Security Education Center-Engineering Institute (NSEC-EI) recently received the Best Paper Award at the Third Annual International Conference for Sustainable Development. Their winning paper is "Potential Structural Health Monitoring Tools to Mitigate Corruption in the Construction Industry Associated with Rapid Urbanization."

The paper builds on more than a decade's worth of research on the topic of structural health monitoring at the Engineering Institute. The work involved technical staff in a variety of scientific and engineering disciplines, and the participation of hundreds of students, postdocs and visiting researchers participating in Lab Engineering Institute Student Programs, including the Los Alamos Dynamic Summer School and the Advanced Studies Institute.

The theme of the conference was "Implementing the Sustainable Development Goals: Getting Started." The conference aimed to identify and share practical, evidence-based solutions to support the United Nations Sustainable Development Goals. The conference was held at Columbia University in anticipation of the UN Sustainable Development Summit, which took place immediately after the conference. The event drew more that 1,000 participants and speakers, including the presidents of Liberia, Malta and Rwanda; the First Lady of Panama; and U.N. Sustainable Development Solution Network Leadership Council members.

The team's achievements

The researchers' work supports the UN Sustainable Development Goal for Sustainable Cities and Communities. The presentation focused on infrastructure health monitoring technologies developed at the Laboratory's Engineering Institute. These technologies could be applied to mitigate corruption in the construction industry during rapid urbanization in the developing world. The worldwide investment in infrastructure development in the coming decades is projected to be in the trillions of dollars, with the majority of this development occurring in areas that suffer from high levels of corruption. Therefore, methods to verify that construction is completed to specification and in a safe manner are required. The paper also addresses the need to bring structural monitoring technologies to the city scale to enable resilient infrastructure and ensure that infrastructure is operated in a safe and legal manner.

The Los Alamos presentation introduced the sustainable development community to structural health monitoring innovations that may help reduce corruption encountered during development activities. To achieve a global impact, the methods must facilitate monitoring and construction verification in an agile, low-cost fashion that goes beyond the individual structure scale to the city scale.

The Laboratory researchers presented novel, cross-disciplinary approaches that they are investigating for infrastructure health monitoring. These include imager-based techniques for structural assessment on the city scale, taking aerial robotic structural inspection beyond imaging, remotely readable tamper-evident seals, and haptic interfaces (human-computer interaction technology) for infrastructure monitoring. The Engineering Institute continues to find opportunities for these technologies to help implement the Sustainable Development goals worldwide.

Los Alamos National Laboratory   **www.lanl.gov**   **(505) 667-7000**   **Los Alamos, NM**